

**ELECTRIC AND MECHANICAL ASSIST HIGH DENSITY MOBILE SHELVING
SYSTEMS, CASE TYPE, 4-POST "LT" TYPE AND CANTILEVER SHELVING
SPECIFICATIONS**

PRODUCTS/DESIGN DETAILS

1. Track

- 1.1 Track shall be constructed of solid steel with a minimum 5/8" surface width. Top of track shall be flush with and not extend above the finished floor covering.
- 1.2 All track connection joints shall be designed to provide horizontal and vertical continuity between track sections, to gradually transfer the concentrated wheel point load to and from adjoining track sections and to prevent track separation.
- 1.3 Where stationary platforms end in an open area, a track skirt shall be installed to cover the gap created from the slab floor to the top of the track and elevated deck.
- 1.4 All tracks are to be securely fastened to the floor and grouted the entire length of the tracks to assure uniform load transmission to the floor, total rail support, and to minimize deflection.

2. Elevated Deck System:

- 2.1 An elevated deck shall be installed beneath the entire range length and between the track housings. Elevated deck shall be constructed of plywood, particle board, steel or structure wood.
- 2.2 A ramp of steel or plywood shall be provided at the front of the assembly to allow for a smooth transition from the main floor onto the deck.
- 2.3 The ramp shall not extend past the front of the units into the main access aisle.
- 2.4 Floor covering on ramp and elevated deck shall be provided by the State of Louisiana.
- 2.5 Finished floor and floor covering shall create a flush surface with the top of the track.

3. Carriage:

- 3.1 Carriages shall be minimum 1000 lbs. per linear carriage foot capacity, shall be constructed of steel or aluminum alloy and be bolted, welded or riveted. Bolted carriages shall use steel bolts and vibration-proof hardware. Riveted carriages must use structural rivets. If carriages are bolted, there shall be no exposed bolt heads on the exposed carriage face.

- 3.2 Carriage design shall be capable of safely retaining shelving sections to eliminate sliding or becoming dislodged off of carriage.
- 3.3 Stationary platform construction shall be the same in materials, design and height as the movable carriage and shall be securely anchored to the tracks/floor underneath.

4. Wheels:

- 4.1 Wheels shall be guided by either a roller guide, flanged guide or V-design in track, and shall be designed to be compatible with the type of track used.
- 4.2 Wheels shall be constructed of solid steel, or cast iron, precision ground, balanced and hardened. All wheel bearings shall be permanently sealed, shielded and lubricated.
- 4.3 Drive wheels shall be minimum 5" diameter.

5. Mechanical Assist Operation:

- 5.1 Each mobile carriage shall be equipped with a mechanical assist handle, which transmits power through a direct drive to the drive wheels. One pound of effort on the handle shall move a minimum of 3,000 pounds of carriage load.
- 5.2 No more than 7 complete turns of the handle shall be required to open a 36"W aisle.
- 5.3 The mechanical-assist system shall be completely enclosed behind an end panel to prevent tampering by unauthorized persons.

6. Mechanical Assist Safety System:

- 6.1 Each mechanical assist operator shall be equipped with a manually engaged safety lock device.

7. Electric Power and Controls:

- 7.1 Each carriage to be equipped with a 90 volt D.C. current limited, fractional horsepower gear motor.
- 7.2 System controls shall start motors sequentially to minimize power demands and shall brake motors to rest dynamically to provide smooth operation.
- 7.3 Overhead pantograph or in rail power and communications distribution system shall conceal all interconnecting wiring.

- 7.4 There shall be one carriage control handle or button for each movable carriage. The control shall have, at minimum, a RESET/STOP push-button and a backlit red reset light. All controls and indicator lights shall be solid state and shall provide visual indication of safety system operation.
- 7.5 Either a hand-held rechargeable or on-board rechargeable power override unit shall be used if there is total power failure to the system.
- 7.6 Entire system shall be U.L. listed. Proof of compliance shall be provided.
- 7.7 Modifications to the building to accommodate the power requirements for an electric system requiring electrical connections will be made by the State of Louisiana at no cost to the successful bidder. This will not include any final connections of the system itself to the buildings power source. The successful bidder will be required to use a licensed electrician to make all final connections to the mobile system.

8. Electric Safety System:

- 8.1 Every potential aisle shall be protected with one (1) safety sweep running the entire length of the movable carriage. When activated, the affected carriage shall hard-brake-stop. All other moving carriages shall soft-stop. Safety sweep location shall be identified by OSHA demarcation tape for visual identification.
- 8.2 A supervisor controlled safety system override key shall be provided for system. An audible warning beep will alert the user when the carriages are moving in this mode, since the safety system is not in operation.
- 8.3 Controls shall automatically lock aisle out once created. Provide a manual reset button on control head to reset carriages prior to movement and to facilitate a visual check of the aisle before initiation movement.
- 8.4 Every potential aisle shall be protected with a safety system, so that when activated, the affected carriage shall hard-brake-stop. All other moving carriages shall soft-stop. Safety system location shall be identified by OSHA demarcation tape for visual identification.

9. Face Panels:

- 9.1 All exposed ends of mobile carriages and stationary platforms shall have plastic laminate or steel face panels. Plastic laminate panels shall have a core of 45 lb. density particle board. Color is to be selected by the owner from manufacturer's standard finishes.
- 9.2 Panels shall cover the entire height and width of the shelving and carriage face
- 9.3 Provide card holders and all other hardware for a complete installation.

SHELVING

CASE TYPE

Shelving:

- CT-1: Five basic parts: uprights, shelves, shelf supports, shelf reinforcements and dividers which are assembled without loose hardware, nuts, bolts, sway braces, gussets, clamps, brackets, adapters, accessories, modifications and special tools of any kind.
- CT-2: There shall be no holes on exposed surfaces, except that the shelves shall be punched for dividers and two holes for center stops.
- CT-3: Shelves shall be adjustable on 1½" or 2" centers.
- CT-4: Uprights shall be 76 ¼"H for all mobile shelving systems and 88 ¼"H for all stationary shelving. Total mobile shelving system height shall be approximately 84"H.

Case Uprights:

- CU-1: Uprights shall consist of 18-gauge cold rolled steel formed into either a 2" wide "T" shape common post or a 1" wide "L" shape end post, with keyhole-shaped slots on 1½" centers vertically on the inner face of the posts.
- CU-2: There shall be no holes on any visible surface.
- CU-3: Front and back posts shall be joined by two welded 24-gauge closure panels between the posts and flush with the outer edges of the uprights.
- CU-4: All 24"D and 30"D uprights shall have a stiffening channel formed along the vertical center line of the closure panel.
- CU-5: All row end uprights shall be "L" shape and all intermediate (common) uprights shall be "T" shape.

Shelf:

- SH-1: Formed of 22 gauge cold rolled steel with 3/4" flanges on all sides turned in front and back.
- SH-2: Shelves adjustable on 1 ½" centers.
- SH-3: Shelf shall be slotted and punched to accept dividers and center stops.
- SH-4: Top shelves shall be non - slotted.

Shelf Supports:

- SS-1: Formed of 11 gauge steel for all 42"W sections and shall provide two (2) shelf supports per shelf.
- SS-2: Supports are to have double rivets except bottom supports on bottom shelf of all mobile systems, which will have single rivets, to eliminate gap between bottom shelf and top of carriage.

Shelf Reinforcement:

- SR-1: Shelf reinforcements shall be provided where one shelf is used for double entry or where single entry has a shelving depth which requires shelf reinforcements. All 42"W x 24"D shelves shall have two (2) shelf reinforcements and all 42"W x 30"D shelves shall have three (3) shelf reinforcements per shelf, excluding top shelf.

Dividers:

- SD-1: Formed of a minimum of 20 gauge steel and shall fit easily into slotted shelves, center stops and back stops.
- SD-2: There shall be two (2) dividers per shelf opening on all 42"W sections of shelving.

Center Stops:

- CS-1: Slotted center stops formed of 18 gauge steel with a formed channel at top and stiffener at bottom and slotted to accept dividers. Center stops to be used on all double face shelving sections and are to be attached with bolts and nuts. One (1) per double face shelf, excluding top shelf.
- CS-2: Center stops shall be installed as per manufacturer's specifications.

Back Stops:

- BS-1: Slotted back stops shall be formed of 18 gauge steel and slotted to accept dividers. Back stops shall be used on all single face shelving sections. One (1) per single face shelf, excluding top shelf.
- BS-2: Back stops shall be installed as per manufacturer's specifications.

Steel Backs:

- SB-1: Steel shelving back shall be formed of a minimum of 24 gauge steel and closes off the back of the shelving section.

Back Holder:

BH-1: Back holder shall be formed of a minimum of 20 gauge steel and holds the top of steel shelving back in place.

Hinged Doors:

HD-1: Hinged doors shall be formed of a minimum of 20 gauge steel and are designed in pairs to enclose a full height section of shelving and provide security for contents. Doors are center opening with a positive two-point locking rod and keyed lock core. Door locks shall have the ability to be keyed alike or differently.

SHELVING

4-POST "LT"

Shelving:

- LT-1: Five basic parts: uprights, shelves, shelf supports, shelf reinforcements and dividers which are assembled without loose hardware, nuts, bolts, sway braces, gussets, clamps, brackets, adapters, accessories, modifications and special tools of any kind.
- LT-2: There shall be no holes on exposed surfaces, except that the shelves shall be slotted and punched for dividers and 2 holes for center stops.
- LT-3: Shelves shall be adjustable on 1 ½" or 2" centers.
- LT-4: Uprights shall be 76 ¼"H for all mobile shelving systems and 88 ¼"H for all stationary shelving. Total mobile shelving system height shall be approximately 84"H.

"LT" Closed Uprights:

- LTCU-1: Formed from two (2") wide 18 gauge cold rolled steel posts rolled into a double wall "T" formation (or "L" formation at row ends) with keyhole slots on 1 ½" centers on the inner wall only.
- LTCU-2: There shall be no holes on any visible surface.
- LTCU-3: Front and back posts shall be joined by welded 24 gauge closure sheet to give the required upright depth rigidity and base for erection.
- LTCU-4: Closed "L" uprights shall be used for row ends. See system component list for closed "T" requirements.

“LT” Open Uprights:

- LTOU-1: Formed from 18 gauge cold rolled steel, rolled in a 2" hollow “T” or 1" wide hollow “L” shape, with keyhole slots on 1 ½" centers on the inner wall only.
- LTOU-2: There shall be no holes in the exposed surface of the post.
- LTOU-3: Front and back post shall be joined by welding 18 gauge spacers to maintain the required distance and add rigidity to the assembly.
- LTOU-4: Open “T” upright shall be used as a common (intermediate) upright between units where noted. See system component list for open upright requirements and where closed “T” uprights are to be used as common (intermediate) uprights between units

Shelf:

- SH-1: Formed of 22 gauge cold rolled steel, for filing applications, or 18 gauge cold rolled steel, for storage applications, with ¾" flanges on all sides turned in front and back. See system component list for 18 gauge or 22 gauge shelf requirements.
- SH-2: Shelves adjustable on 1 ½" centers.
- SH-3: Shelf may be slotted and punched to accept dividers and center stops.
- SH-4: Top shelves shall be non - slotted.

Shelf Supports:

- SS-1: Formed of 11 gauge steel for all 42"W sections and shall provide two (2) shelf supports per shelf.
- SS-2: Supports are to have double rivets except bottom supports on bottom shelf of all mobile systems, which will have single rivets, to eliminate gap between bottom shelf and top of carriage.

Shelf Reinforcement:

- SR-1: Shelf reinforcements shall be provided where one shelf is used for double entry or where single entry has a shelving depth which requires shelf reinforcements. For 22 gauge steel shelves, all 42"W x 24"D shelves shall have two (2) shelf reinforcements and all 42"W x 30"D shelves shall have three (3) shelf reinforcements per shelf, excluding top shelf. For 18 gauge steel shelves, all 42"W x 24"D and 42"W x 30"D shelves shall have two (2) shelf reinforcements per shelf, excluding top shelf.

Dividers:

- SD-1: Formed of a minimum of 20 gauge steel and shall fit easily into slotted shelves, center stops and back stops.
- SD-2: There shall be four (4) dividers per shelf opening on all 42"W sections of shelving where dividers are required. See system component list for divider requirements.

Center Stops:

- CS-1: Slotted center stops formed of 18 gauge steel with a formed channel at top and stiffener at bottom and slotted to accept dividers. Center stops to be used on double face shelving sections and are to be attached with bolts and nuts. One (1) per double face shelf, excluding top shelf, where required. See system component list for center stop requirements.
- CS-2: Center stops shall be installed as per manufacturer's specifications.

Back Stops:

- BS-1: Slotted back stops shall be formed of 18 gauge steel and slotted to accept dividers. Back stops to be used on single face shelving sections. One (1) per single face shelf, excluding top shelf, where required. See system component list for back stop requirements.
- BS-2: Back stops shall be installed as per manufacturer's specifications.

Steel Backs:

- SB-1: Steel shelving back shall be formed of a minimum of 24 gauge steel and closes off the back of the shelving section.

Back Holder:

- BH-1: Back holder shall be formed of a minimum of 20 gauge steel and holds the top of steel shelving back in place.

Hinged Doors:

- HD-1: Hinged doors shall be formed of a minimum of 20 gauge steel and are designed in pairs to enclose a full height section of shelving and provide security for contents. Doors are center opening with a positive two-point locking rod and keyed lock core. Door locks shall have the ability to be keyed alike or differently.

Rollout Drawers:

- RD-1: Rollout drawers shall be steel with lockable fixed drawer front attached to a frame assembly and extension slides designed to fit standard 4-Post shelving using only "Closed" uprights for structural integrity. File and Storage Drawers shall have three (3) adjustable steel dividers per drawer.
- RD-2: Drawer locks shall have the ability to be keyed alike or differently.
- RD-3: Rollout drawer units shall be provided with a positive interlock system which prevents tip-over of shelving units by allowing only one drawer to open and extend at a time.

SHELVING

CANTILEVER

Welded Frame Upright

- WFU-1: The welded frame shall consist of 2 vertical upright columns constructed of min. 16-gauge steel. Upright column shall be 2" deep. The uprights are fully welded to a tubular top spreader and a channel bottom spreader. The uprights shall have shelf attachment slots on 1" increments the entire length of the upright. Uprights shall include location indicators the entire length of upright on a minimum of 6" centers. Uprights shall be 84"H.
- WFU-2: The tubular top and bottom spreaders shall be a minimum of 16-gauge steel

Base Supports:

- BS-1: A base support shall be provided to provide lateral unit stability. The support shall be a minimum of 16-gauge steel. Support shall attach to frame upright. Support shall be designed and constructed with shear tabs that interlock/mate with the upright to provide a positive connection that will give additional stability to welded frame in addition to the bolted connectors. Shear tabs ensure squareness and alignment of the base support to the welded frame. Base support design must allow the frame to transfer loads to floor or levelers.

Leveler Kits:

- LK-1: Static shelving units shall include leveling feet. Upright frames and/or base supports shall include leveling feet. Cantilever shelving units installed on mobile carriages shall use gussets or gusseted base supports to support and/or level the unit. Gussets or gusseted base supports shall be installed per manufacturer's standard installation requirements and be made of a minimum of 16 gauge steel.

Shelf End Brackets:

SEB-1: Shelf end brackets shall be made of minimum 16-gauge steel of a depth not less than that of the shelf on which they are used. The top and front edges shall be rounded or designed to prevent accidental knifing of material. Shelf brackets shall have a minimum of two hooks at the top for engaging into the column (post) and one safety lug to prevent accidental dislodgment at the bottom. For aesthetic reasons as well as to prevent sharp corners, the upper front corner of the shelf brackets shall be radiused.

Base Shelves:

BAS-1: Base shelves to be formed of either triple 90-degree bend on the rear of shelf and a double bend with a 3" surface at the front, or be formed of ¾"H box shaped front and rear faces having a minimum of three 90-degree bends per face with the surface of the bottom shelf being flush with the top surface of the 3"H bottom spreader. All shelves shall be a minimum of 18-gauge cold rolled steel.

Shelves:

S-1: Shelves shall be formed from minimum 20 gauge for 8", 9" and 10" shelves and 18 gauge for 12", 13" and 15" cold rolled steel with a triple 90-degree bend on both front and rear edges with a shelf thickness to be ¾". Slotted shelves shall be slotted to accept adjustable steel dividers. Plain shelves shall have no slots or holes on visible surface.

Dividers:

- D-1: Formed of a minimum of 20 gauge steel and shall fit easily into slotted shelves and slotted backstops.
- D-2: There shall be two (2) dividers per shelf opening on all 36"W sections of shelving where dividers are required. See system component list for divider requirements.
- D-3 : Adjustable dividers shall be available in a minimum of 6" height with depth of the dividers matching the depth of the shelf.
- D-4: Findable divider shall be constructed of a minimum of 16-gauge steel, be available in either 6" or 9" height, be of one piece construction and have a minimum 5" base.

Snap In Hanging Wire Book Support:

- SHWBS-1: Formed of a minimum of .25 diameter wire and shall snap into the bottom of the shelf above.
- SHWBS-2: There shall be one (1) book support per shelf opening on all 36"W sections of shelving where book supports are required. See system component list for book support requirements.

Back Stops:

- Bk-1: Slotted back stops shall be formed of a minimum of 20 gauge steel, be full height back stops (approx. 6"H) and slotted to accept dividers, or be incorporated in the shelf construction with a vertical flange 5"H with a 1/3" return to the rear and 1/4" return down, and be slotted to accept dividers.
- BK-2: Back stops shall be installed as per manufacturer's specifications.

Metal Canopy Tops:

- MCT-1: Shall be formed from minimum 20-gauge cold rolled steel with a triple 90-degree bend on front edges with a maximum edge thickness of 3/4". Single face and double face units to be one-piece design.

10. Paint and Color:

- 10.1 Shelving to have powder coat paint finish to resist abrasion and the color is to be selected by the owner from manufacturer's standard finishes.

11. Installation:

- 11.1 Units are to be installed in accordance with manufacturer's written instructions.

12. Cleanup:

- 12.1 Installation shall be left in broom clean condition, complete and ready for use by the department.